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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,931	06/26/2003	Sang-Min Jang	041993-5218	3408
9629	7590	05/18/2005	EXAMINER	
MORGAN LEWIS & BOCKIUS LLP 1111 PENNSYLVANIA AVENUE NW WASHINGTON, DC 20004			WANG, GEORGE Y	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/603,931

Applicant(s)

JANG ET AL.

Examiner

George Y. Wang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) 20-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 and 32-50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1-19 and 32-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (U.S. Patent No. 5,517,342, hereinafter "Kim") in view of Sato (U.S. Patent No. 6,770,908).

3. As to claims 1 and 32, Kim discloses a liquid crystal display (LCD) device and method (fig. 1) comprising a plurality of data lines (fig. 1, ref. 5a) along a first direction

and a plurality of gate lines (fig. 1, ref. 1) along a second direction that are arranged perpendicular to define a plurality of pixel regions (col. 2, lines 30-31), such that each of the gate lines have at least one first set of protrusions and depressions (fig. 1, ref. 10) extending with respect to a thickness direction of the substrate, a driving device (fig. 1, ref. TFT) within each pixel region, and a pixel electrode (fig. 1, ref. 4) within each pixel region.

However, the reference fails to specifically disclose a separate metal layer overlapping each of the gate lines to create a storage capacitor.

Sato discloses an LCD device and method having a separate metal layer overlapping each of the gate lines to create a storage capacitor (fig. 1, ref. 70).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a separate metal layer overlapping each of the gate lines to create a storage capacitor since one would be motivated to prevent leakage of the maintained image signal (col. 11, lines 39-42). Ultimately, this serves to provide a display device in which respective pixels have a high opening ratio and where deterioration of the characteristics of the TFTs due to light leakage can be reduced for yielding a high image quality display (col. 4, lines 5-11).

4. Regarding claims 2-4 and 33-35, Kim discloses the LCD device and method as recited above where the first set of protrusions and depressions is arranged along the first and second directions, forming a lattice shape (fig. 1, ref. 10).

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5. As per claim 5-6 and 36-37, Kim discloses the LCD device and method as recited above where the driving device includes a thin film transistor (TFT) (fig. 1, ref. TFT), a gate electrode (fig. 5, ref. 1), a gate insulating layer (fig. 5, ref. 2), a semiconductor layer (fig. 5, ref. 3), and a source electrode (fig. 5, ref. 5b) and a drain electrode (fig. 5, ref. 5a) on the semiconductor layer.

6. As to claims 7-10 and 38-41, Kim discloses the LCD device and method as recited above having a protrusion layer that includes metal material (fig. 1, ref. 10; col. 2, lines 60-63) and insulation material (fig. 2, ref. 2), however, the reference fails to specifically disclose at least one first protrusion/depression layer on the substrate.

Sato discloses an LCD device and method that has at least one first protrusion/depression layer on the substrate (fig. 3, ref. 10CV).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included at least one first protrusion/depression layer on the substrate since one would be motivated to reduce defective images resulting from faulty orientation of the liquid crystals (col. 14, lines 9-19). Ultimately, this serves to provide a display device in which respective pixels have a high opening ratio and where deterioration of the characteristics of the TFTs due to light leakage can be reduced for yielding a high image quality display (col. 4, lines 5-11).

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7. Regarding claims 11-12 and 42-43, Kim discloses the LCD device and method as recited above where the metal layer includes metal material similar to the metal material of the source and drain electrodes (col. 9, lines 20-24).

8. As per claims 13-19 and 44-50, Kim discloses the LCD device and method as recited above where at least one first protrusion/depression layer on the semiconductor layer (fig. 5, ref. 3) and along the source and drain electrodes (fig. 5, ref. 5a, 5b), forming a lattice shape (fig. 1), and further including a metal material (fig. 1, ref. 10; col. 2, lines 60-63) and insulation material (fig. 2, ref. 2).

Response to Arguments

9. Applicant's arguments filed February 28, 2005 have been fully considered but they are not persuasive.

With respect to Applicant's clarifying remarks regarding the claim objections, the objections to claims 7-10, 16-19, 38-41, and 47-50 have been withdrawn.

Applicant amends the independent claims to now recite that each of the gate lines has at least one first set of protrusions and depressions "extending with respect to a thickness direction of the substrate." However, the amendment does not adequately overcome the prior art references used. The reason is because the substrate is a three-dimensional component and thus has three thicknesses. Because neither the claims or the specification specifies what is meant by this thickness direction, it is clear that the Kim reference teaches that each of the gate lines has at least one first set of protrusions

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and depressions (fig. 1, ref. 10) extending with respect to a thickness direction of the substrate.

As a result, Examiner holds to the validity of the references used and maintains rejection.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

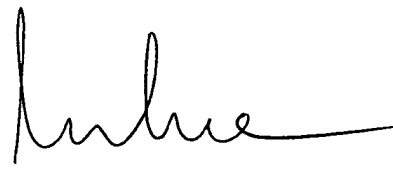
Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Y. Wang whose telephone number is 571-272-2304. The examiner can normally be reached on M-F, 8 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gw
May 16, 2005



DUNG T. NGUYEN
PRIMARY EXAMINER